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| 10/743,172 | 12/22/2003 | Kenichi Kawase | 112857-453 | 7752 |
| 29175 7590 07/24/2008 BELI., BOYD & LLOYD, LLP P. O. BOX 1135 CHICAGO, IL 60690 | | | | |
| EXAMINER | | | | |
| LEE, CYNTHIA K | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/743,172

Applicant(s)

KAWASE ET AL.

Examiner

CYNTHIA LEE

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-12 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4, 6-8, 10-12 and 14-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response to Amendment

This Office Action is responsive to the amendment filed on 5/12/2008. Claims 1-4,6-12,14-19 are pending. Claims 1 and 9 are withdrawn from further consideration as being drawn to a non-elected invention. Applicant's arguments have been fully considered and are persuasive. However, upon further consideration, the instant claims are rejected under new a new interpretation of the prior art of record. Thus, claims 2-4,6-8,10-12,14-19 are non-finally rejected for reasons stated herein below.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 2-4,6-8,10-12,14-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujimoto et al. (US 2004/0224231 A1), as evidenced by Asahina (US 2007/0275301).

With respect to claims 2-4,8,10-12,14,16, Fujimoto et al. teach a lithium secondary battery, wherein an anode comprising a current collector having projections and a silicon thin film is deposited on the current collector by using an RF sputtering technique. The current collector component diffuses into the thin film to form a solid solution. See paragraphs 50,59, claim 13, Figure 4.

With respect to claims 6,7,15, Fujimoto et al. teach an electrolytic deposition of copper particles on the copper current collector. See paragraph 50.

With respect to claims 2 and 10, Fujimoto et al. teach the surface roughness of the copper foil is 5.99 um. See Table 1. The surface roughness R_y is the maximum height. See Asahina (US 2007/0275301) [0012].

With respect to claims 17,18, Fujimoto et al. teach the lithium rechargeable battery comprising the use of carbonates as solvent the use of lithium salts as the electrolyte salt. See paragraph 38.

With respect to claim 19, Fujimoto et al. teach the use of LiCoO_2 as the cathode active material. See paragraph 39.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-4,6-8,10-12,14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akagi et al. (JP 11-135115) in view of Fujimoto et al. (US 2004/0224231 A1), as evidenced by Asahina (US 2007/0275301).

With respect to claims 2-4,8,10-12,14,16, Akagi et al. teach a lithium secondary battery, wherein an anode comprising a current collector and a silicon thin film is deposited on the current collector by using an RF sputtering technique. The resulting

anode is heat treated under vacuum. See paragraph 5-8. However, Akagi et al. do not teach the use of a current collector having projections. Fujimoto et al. teach a lithium secondary battery, wherein the projections on the copper collector would help accommodate a change in volume of the active material when it expands and shrinks during charge and discharge. See paragraphs 50,83. With respect to claims 2 and 10, Fujimoto et al. teach the surface roughness of the copper foil is 5.99 μm . See Table 1. The surface roughness R_y is the maximum height. See Asahina (US 2007/0275301) [0012]. Therefore, it would have been obvious to one of ordinary skill in the art to form projections in the current collector of Akagi using the method of Fujimoto, because Fujimoto et al. teach the projections on the copper collector help accommodate the change in volume of the active material during charge and discharge cycles.

Moreover, Akagi and Fujimoto do not specifically disclose the silicon thin film alloys with the copper current collector. However, it is the position of the examiner that such properties are inherent, given that both Akagi et al. and the present application utilize the same processing procedures and thermal treatment. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 6,7,15, Fujimoto et al. teach an electrolytic deposition of copper particles on the copper current collector. See paragraph 50.

With respect to claims 17,18, Akagi et al. teach the lithium rechargeable battery comprising the use of carbonates as solvent the use of lithium salts as the electrolyte salt. See paragraph 10.

With respect to claim 19, Akagi et al. teach the use of LiCoO_2 as the cathode active material. See paragraph 9.

6. Claims 2-4,6-8,10-12,14-16,18,19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neudecker et al. (US 6,242,132 B1) in view of Fujimoto et al. (US 2004/0224231 A1), as evidenced by Asahina (US 2007/0275301).

With respect to claims 2-4,8,10-12,14,16,18, Neudecker et al. teach a lithium secondary battery, wherein an anode comprising a current collector and a silicon-tin oxynitride film is deposited on a heated current collector by using an electron beam evaporation technique. See Column 7, Lines 1-43. However, Neudecker et al. do not teach the use of a current collector having projections. Fujimoto et al. teach a lithium secondary battery, wherein the projections on the copper collector would help accommodate a change in volume of the active material when it expands and shrinks during charge and discharge. See paragraphs 50,83. With respect to claims 2 and 10, Fujimoto et al. teach the surface roughness of the copper foil is 5.99 μm . See Table 1. The surface roughness R_y is the maximum height. See Asahina (US 2007/0275301) [0012]. Therefore, it would have been obvious to one of ordinary skill in the art to form projections in the current collector of Neudecker using the method of Fujimoto, because

Fujimoto et al. teach the projections on the copper collector help accommodate the change in volume of the active material during charge and discharge cycles.

Moreover, Neudecker and Fujimoto do not specifically disclose the silicon thin film alloys with the copper current collector. However, it is the position of the examiner that such properties are inherent, given that both Akagi et al. and the present application utilize the same processing procedures. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 6,7,15, Fujimoto et al. teach an electrolytic deposition of copper particles on the copper current collector. See paragraph 50.

With respect to claim 19, Neudecker et al. teach the use of LiCoO_2 as the cathode active material. See Figure 4.

Response to Arguments

Applicant's arguments filed on 5/12/2008 have been considered but are moot in view of the new interpretation of the prior arts applied in the rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CYNTHIA LEE whose telephone number is (571)272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art
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